Infrastructure to Monitor Climate Change Response in Piermont Marsh

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Abstract.

I'm seeking $8,000 to purchase supplies for the installation of research infrastructure in the Piermont Marsh. The infrastructure will include tide gauges, sediment accretion measurement apparatus, survey markers and platforms to allow researchers to work above the marsh surface. The infrastructure will be applied to:

- Making the Marsh a sentinel site of tracking the impacts of climate change regarding:
  - Sea-level rise and marsh surface height
  - Surface vegetation adaptation
  - Aquatic vegetation adaptation
- Compiling carbon and nutrient budgets for the modern marsh.
- Establishing time series of bacterial concentrations and fluxes.
- Measuring succession of Phragmites australis (the invasive genotype of Common Reed)
- Variations in nekton populations with respect to physical setting, vegetative zone and the height of the marsh surface above sea level.

Most of the installation and sampling will be conducted by NYC public high school teachers and their students, along with several undergraduates, all of whose summer salaries are covered through 2013 by an educational grant from the National Science Foundation.

Proposed Research.

For the past six years I've worked with a group of high school teachers and students, undergraduate and graduate students and Lamont scientists to establish an environmental monitoring program in Piermont Marsh. We have measured: juvenile fish populations and diversity, grass and sedge densities, nutrients, bacteria, and soil carbon distribution (both surface soils and in 1-meter cores). During this period, we have developed sampling methods which can be implemented by teams of students managed by their teachers and Lamont scientists, which are also rigorous enough to yield high quality data. Until now, the project has been funded through educational grants, and has provided scientific and technical training for about a dozen science teachers and about 100 high school students from neighborhood high schools in New York City. As an educational program, it has been a success: all of our students go to college and about 50% of them major in science or engineering. The Program has also provided us with a solid organizational infrastructure and some good baseline data, especially regarding fish distributions, nutrients and soil carbon. These data have been presented at recent meetings of the GSA, AGU (both the Fall meeting and Ocean Sciences) and the Society of Wetlands Scientists.